

**TESTIMONY
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BEFORE THE

**COMMITTEE ON HEALTH, EDUCATION, LABOR & PENSIONS
U.S. SENATE**

**THE PATH FORWARD: BUILDING ON LESSONS LEARNED
FROM THE COVID-19 PANDEMIC
JULY 27, 2021**

Chair Murray, Ranking Member Burr, and distinguished Senators of the Committee. I am grateful to have the opportunity to testify before this Committee and discuss my opinion as to what important lessons have been learned during the COVID-19 pandemic and how might these lessons inform our response to future pandemics and other crises in healthcare. I offer my testimony as only one member of the healthcare community, a community which certainly has a wealth of lessons from this pandemic we can all learn from, and we should continue to elicit these lessons from all of my colleagues beyond my testimony today. These lessons learned I present to the Committee are from my experience at University Medical Center New Orleans as an Intensive Care Unit physician, the Director of Medical Critical Care Services, and as a healthcare worker who has treated hundreds of critically ill adults with COVID-19. University Medical Center New Orleans is a public-private partnership with the State of Louisiana carrying on the legacy of Charity Hospital in the city of New Orleans and aims to provide the best possible care for a diverse and underserved patient population, including the uninsured and low-income populations.

Learning in real-time from “forward positions” during a pandemic prepares locations which will soon experience similar strain in their healthcare system

Pandemic preparation in early 2020 had been well underway prior to the first positive test in the New Orleans area on March 9, 2020. Existing guidelines¹ for care and hospital organization were being incorporated into pandemic planning; however, at the time there was relatively little known about how the COVID-19 pandemic could strain

the healthcare system. When large numbers of patients seek healthcare for an illness that has the potential to cause severe disease, where would we see the healthcare system strain under that new weight?

In March of 2020, New Orleans had a rate of rise of positive SARS-CoV-2 tests² similar to New York City and the Lombardy Region of Italy³. The Lombardy Region was already experiencing marked strain in their ability to deliver healthcare due to this rapid influx of patients with COVID-19. This was, perhaps, not just a forward position in the fight against COVID-19 with early experience with this disease, but also one of the first regions to report how the pandemic was straining their healthcare infrastructure. Importantly, this experience was relayed to the world in not just the news media but also rapidly in the scientific literature. While New Orleans was experiencing our first positive cases and seeing an exponential rise, on March 13, 2020, physicians from the Lombardy Region reported their experience in the *Journal of the American Medical Association* about how patient surges were affecting hospital operations. It was an early description not just of what illness SARS-CoV-2 causes, but how large numbers of patients with this disease impact a healthcare system. Among groups of healthcare personnel in New Orleans planning a response to a potential surge of patients, their report on forecasting ICU demand was both shocking and critical to our own preparatory work.

Nothing captured our attention more than the forecast modeling included in the publication suggesting that if an exponential growth model predicting possible ICU demand was accurate, as many as 14,542 ICU admissions would occur in the Lombardy Region in the next seven days. From our perspective as healthcare

personnel in New Orleans planning how to respond to a surge in COVID-19 patients, we were alarmed that a similar exponential rise in positive cases had begun in New Orleans and there is not a healthcare system in the world that can manage the influx of thousands of critically ill adults over such a short period of time.

The Lombardy region went on to experience marked strain in their healthcare system during March of 2020; however thankfully not to the degree that their exponential forecast modeling predicted⁴. Of critical importance to our preparations at University Medical Center New Orleans and other hospitals in the region was being able to learn, in almost real-time, not just information from the lay press media but also actionable information on operations in healthcare systems currently experiencing strain and their response to that strain. Furthermore, if operational impact occurred, potential mitigation strategies, countermeasures, and predictive modeling could be used to estimate the potential scope of the problem.

Planning for future COVID-19 surges and for any new crisis that will impact the healthcare system worldwide should involve organized, intentional information gathering from locations currently experiencing the crisis. Information collected should be beyond what is reported in the lay media and include specific operational information of local healthcare systems, the degree of strain in each operational unit, identification of common problems, and elucidation of solutions. This information should be available to other hospital systems in real-time and disseminated not only in medical journals but also in an open-access, nationally centralized method, so that healthcare systems planning their response to an emerging problem can get information from a single location on the experiences of systems currently responding the crisis. Our ability to

learn from the experiences in Italy and New York City was vital in planning how our system of hospitals in New Orleans would respond to this crisis. It was clear that in the early fight against the pandemic, successful public health measures would be key in preventing complete collapse of the healthcare system and success on the level of individual hospital systems would be determined by their ability to manage a common problem in healthcare: hospital strain.

Managing hospital strain is vital in a healthcare system's response to COVID-19 and any future healthcare crisis

Hospital capacity strain, defined as “excessive demand on the strength, resources, or abilities of a hospital and any resource the hospital uses to provide care (e.g. beds, nurses, physicians, equipment)”, is a problem that has existed in healthcare for decades⁵. Prior to the COVID-19 pandemic, hospitals would experience strain on a smaller scale. For example, what systems are in place to respond when an emergency department is full with a large number of patients in a waiting room, how does a hospital manages mass casualty incidents, or how do we care for critically ill adults when the ICU is full and these patients have to remain in the emergency department? Hospital strain occurs much earlier than the nightmare scenarios of running out of ventilators or other vital resources and having to invoke crisis standards of care. However, prior to and during the COVID-19 pandemic⁶, hospital strain has been repeatedly associated with increased risk of poor patient outcomes. A recent study in the *Annals of Internal*

Medicine estimates that influxes of COVID-19 patients causing excessive demand on hospital resources may have contributed to as many as 1 in 4 deaths related to COVID-19 in the United States⁷.

As previously stated, it was clear early in the COVID-19 pandemic that hospital strain would be a vital problem for healthcare systems to manage in order to save as many lives as possible. Our response in March of 2020 to decrease the impact of this strain on our hospital system and specifically our intensive care units was to “scale” critical care services. Scaling critical care services via the development of what is referred to as surge capacity has been performed for decades around the world in times of acute, brief periods of need. Guidelines on how to respond to ICU strain by creating ICU surge capacity have been published prior to the COVID-19 pandemic¹. These guidelines were used by many hospital systems during the COVID-19 pandemic, including ours, and provided a framework on how to create additional care teams, how to re-organize staff to accommodate more patients, recommendations on communications and triage, and other operational guidance. These guidelines are purposefully broad in recommendations so that they are applicable to any disaster or pandemic and, therefore, additional response was needed on the hospital level to address the strain unique to COVID-19: an illness that causes a large influx of critically ill adults with a high severity of illness and continues to strain the system over the course of months and now, over a year.

At University Medical Center New Orleans, we scaled critical care for COVID-19 in the following ways. First, we focused on increasing the uniformity of critical care provided by improving the application of evidence-based critical care practices to all ICU

patients. Too many different ways of caring for a large number of critically ill adults would quickly extinguish the bandwidth of an ICU. Given the concern early in the pandemic of hospitals running out of ventilators or ICU beds, we used the medical evidence that has existed for decades in critical care medicine that tells us what practices to use to prevent a patient needing a ventilator, if a ventilator is needed using evidence-based practices to help the patient improve and be liberated from the ventilator as soon as possible, and uniformly applying practices known to help patients survive and no longer need an ICU bed.

Second, we scaled critical care capacity by adding more nurses, therapists, and physicians to ICUs, as recommended in guidelines¹, by a partnership between the LCMC Network of hospitals and the Louisiana State University and Tulane Schools of Medicine who provided additional physician support. Experienced nurses and other staff were brought in from other areas of the hospital. I cannot emphasize enough the importance of our existing and newly added ICU healthcare workers in responding to this crisis and their bravery for running towards the problem and not away. They work incredibly hard with a sense of purpose and duty, selflessly asking only how they can help their colleagues and our patients. Patients are alive today because of these heroes and institutional partnerships. These additional personnel needed quick, simple instruction on four decades of previous medical evidence of best critical care practices and how to apply this evidence to a large number of COVID-19 ICU patients. We created a number of local protocols and guidelines that were simple enough to hand to a new ICU provider and they could then easily apply best practices to their patients.

Finally, we added processes to make this uniform, evidence-based care reliable with observers ensuring a checklist of good ICU practices was occurring with each and every patient and notifying providers when items needed to be performed. With this approach, intensive care units at University Medical Center New Orleans have achieved COVID-19 survival rates as good or better than survival rates reported in the medical literature, despite high rates of medical comorbidities that portend a worsened prognosis with COVID-19^{8,9}.

Responding to hospital strain by scaling critical care services and creating surge capacity is applicable to future COVID-19 waves and any new emerging threat that has the potential to strain the healthcare system. The implementation of simple, easy to use patient care tools that increase uniformity and reliability are key when healthcare systems are stressed and may avoid the associated increase in poor patient outcomes historically associated with hospital strain.

Dissemination of early experiences and knowledge improves patient care outside of individual hospitals

After several hospital systems in Southeast Louisiana began to experience an influx of COVID-19 patients in March of 2020 and had developed their operational responses to the subsequent strain, Dr. Alex Billioux at the time was the Assistant Secretary for the Louisiana Department of Health's Office of Public Health. Dr. Billioux recognized the extensive organizational work occurring in hospital systems in New Orleans and Baton

Rouge and decided to create a task force of intensive care unit physicians and nurses that would collect the COVID-19 patient care resources developed so far in these hospitals and disseminate those current best practices to hospitals around the state. This Louisiana Department of Health COVID-19 Critical Care Task Force conducted numerous online seminars in the Spring of 2020 where we educated hospitals around Louisiana on the most current, evidence-based practices in caring for COVID-19 patients in the ICU, shared our own operational challenges and solutions, and helped other hospitals solve other challenges they were experiencing. The feedback from hospitals around the state was positive: these hospitals were commonly too busy, too overwhelmed, too understaffed to have time to develop these easy to use patient care tools or come up with operational solutions and these seminars immediately solved many of those problems. The Office of the Assistant Secretary of Health and Human Services (Preparedness and Response), learned of our early experience with COVID-19 in Louisiana and our dissemination of this experience with the Louisiana Department of Health. The Office of HHS ASPR then added our materials developed in Louisiana to the nationwide HHS ASPR COVID-19 Clinical Rounds and had representatives from our Louisiana Task Force conduct live seminars via these clinical rounds.

I personally witnessed two significant impacts during these state- and nation-wide educational seminars. First, many hospitals experiencing strain from a pandemic do not have the time or expertise to develop patient care and operational tools that are evidence-based, easy to use, and reliable. Published pandemic response guidelines from national organizations are available to all hospitals during these crises, but often hospitals need more specific help and problem solving that is not covered in general

guideline statements. Hospitals responded with gratitude when we were able to share what we created with them and allowed them to spend more time in patient care at the bedside. Second, non-evidence-based practices were being disseminated frequently at the time via the internet, social media platforms, and other non-peer reviewed sources¹⁰. This created a great deal of confusion amongst healthcare providers early in the pandemic as to how to treat a patient with COVID-19. These state- and nation-wide educational seminars helped clarify questions from healthcare providers on which practices were supported by medical evidence and recommended by national guidelines.

Future responses to healthcare crises and pandemics need to incorporate on a national level not only the generation of guidelines by medical societies and health organizations, but also frequent, open-access educational offerings and interactive seminars where providers on the front line can share knowledge and help others solve their own operational challenges. Strained hospitals, especially critical access hospitals and hospitals in resource-limited settings, do not have the time or resources to develop their own approach to every aspect of a pandemic. Larger hospital systems can share their experiences via a national educational platform to lighten the workload of the more resource-limited hospitals and collectively decrease strain on the entire healthcare system.

A Learning Healthcare System is vital in the response to the current and future pandemics

Early information gathering and creation of surge capacity were only the first steps in the response to the COVID-19 pandemic. The approaches described above are only a way to save lives while new preventative and treatment tools are created through scientific discovery. Even during a pandemic, “The randomized, double-blind, placebo-controlled trial with systematic and comprehensive collection of safety, biomarkers, short- and long-term survival outcomes, remains the most effective and ethical science to save lives.”¹¹ Within weeks of COVID-19 spreading around the world, not only were healthcare systems focused on treating patients but of equal importance these systems were focusing on learning from these patients in order to save lives in the future. Randomized, controlled trials were designed and instituted in parallel with the provision of patient care, giving the world high-quality answers to questions about almost any proposed treatment for COVID-19. This allowed the medical community to focus on what was discovered to be high-value care for COVID-19 and avoid interventions that were found to be of no benefit.

The first treatment to show robust evidence of benefit in critically ill patients with COVID-19, a steroid medication named dexamethasone, was published online in the *New England Journal of Medicine* on July 17, 2020 in a randomized trial of over 2,000 patients¹². In the span of only approximately seven months, a novel viral pathogen had been discovered, a pandemic had ensued causing high rates of critical illness, and a randomized trial of over 2,000 patients was able to be conducted and shared with the world a treatment that saves lives. Five months later on December 10, 2020, approximately one year since the first reports of patients infected with the novel SARS-CoV-2 pathogen, the results of a randomized trial of the BNT162b2 vaccine in over

43,000 patients was published¹³. The rapidity of these discoveries is unprecedented in the history of Medicine, is a result of the integration of clinical research into patient care via a learning healthcare system approach and is clearly lifesaving.

A learning healthcare system aims to provide high-quality healthcare to patients while also integrating in parallel clinical research infrastructure to learn from patients during their care as to how to improve medical care in the future¹⁴. This integration of patient care and discovery allows the medical community to “learn from what we do and do what we learn.” Lives will be saved in future pandemics as hospital systems continue to integrate clinical research infrastructure into the care of patients.

Caring for the caregiver is a vital component in crisis response

We have asked a lot of healthcare providers caring for COVID-19 patients over the past year and a half. At the beginning of the pandemic, ICU nurses, physicians, advance practice providers, respiratory therapists, pharmacists, environmental services staff, and many others ran towards the problem, not away from it. This was in the setting of many unknowns at the time about caring for COVID-19 patients, including how much of a risk this type of work would be to the health of the caregiver, how long this pandemic would last, when was more help coming, when would we see family again or have a day off, and how do we care for both critically ill patients and our loved ones at home.

Healthcare workers responded to this overwhelming amount of work with a sense of purpose, meaning, and duty. People needed help, it is the nature of the healthcare

worker to help them. There is not an option to run away from this problem, that is not who we are.

Since the beginning of this pandemic, it is easy to see what we have asked of the healthcare system and the people who perform the work of caring for COVID-19 patients. In Louisiana, that has been asking healthcare providers to help rescue all of us from an initial COVID-19 surge in March 2020, followed by again by a second surge in July 2020, a third in December 2020, and now the beginning of our fourth COVID-19 surge in Louisiana in July 2021. The human beings performing these jobs are being strained with every additional COVID-19 patient admitted and every additional COVID-19 surge that occurs.

There is developing evidence that we have strained the human beings providing care to patients with COVID-19 to a critical point. Even a brief review of healthcare news over the past year immediately reveals countless stories of nurses, healthcare's most precious resource and who have shouldered the heaviest load in the COVID-19 response, are leaving the profession at high rates. A recent report by Vivian Health revealed 43% of nurses are considering leaving the healthcare profession in 2021 and 72% report hospital morale has worsened over the past year. In my specialty of Critical Care Medicine, 48% of ICU nurses are considering leaving healthcare. The past and current COVID-19 surges and future healthcare crises will likely be characterized by running out of healthcare workers rather than running out of ventilators and stretching existing healthcare workers to an even greater degree. Expending healthcare resources on recurring COVID-19 surges and losing valuable healthcare workers from the profession will almost certainly impact all the other important goals we hope to

accomplish in improving the health of the nation. How do we improve care for underserved patient populations, increase access to care, make inroads on decreasing cardiovascular disease and diabetes, improve outcomes for patients with cancer, and improve many other aspects of healthcare delivery when healthcare is asked repeatedly to instead focus on COVID-19 surges? How do we accomplish all these goals when so many healthcare workers leave the profession?

Studies of healthcare workers caring for COVID-19 patients have shown that the risk for the development of mental health problems may be as high as other disasters such as the September 11th attacks or Hurricane Katrina¹⁵. Recent research focusing on the psychological impact of COVID-19 on healthcare workers suggests that over one third of healthcare workers are experiencing anxiety or depression¹⁶, as many as one in four have symptoms of post-traumatic stress disorder¹⁷, and symptoms of burnout are experienced by over half of critical care physicians¹⁸. This is the state of the workforce asked to return to the COVID-19 front lines for a second, third, and now fourth wave. We will continue to confront current and future waves, which is our duty, knowing that our physical and mental health is the cost we will continually pay. Our eyes are forward, focused on saving the patients in front of us who unfortunately may pay a higher price. However, in this time when almost all this suffering may be prevented by a vaccine, we ask why is this suffering necessary and when will it end?

Conclusion

I present these lessons learned as one member of the healthcare community, eager to also learn lessons from my colleagues around the world. Experiences during this

pandemic have been diverse and we need to learn from everyone's successes and failures by ongoing discussions as we are having today. Learning from the frontlines, healthcare systems responding effectively to strain, rapid dissemination of medical evidence and operational strategies, understanding that good clinical research results in better clinical care especially when these are integrated, and taking better care of the caregivers are just a few of many approaches to future crises in healthcare. Let us continue to develop the national resolve to end the current crisis by embracing the gift Medical Science has repeatedly provided to humanity for hundreds of years: vaccinations.

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